

# Environmental Sustainability Indicators applied to Tourism Sector in Sicily

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**Abstract** Tourism is an important source of revenue for the economy of a country because it brings money to the State which use it as a source to improve services, buildings, facilities and tourism destinations. Its importance extends to a variety of studies and researches aimed to a better and more sustainable development. The aim of this study is to analyze environmental impact caused by tourism, thanks to the use of indicators, which varies regarding the tourism destination they are linked with.

In particular, some environmental indicators on the city of Catania, in east of Sicily, are analyzed and their interaction could give a wide panorama of Sustainability in Catania and to identify all the advantages on sustainable tourism tools in Sicily.

**Keywords:** Sustainability; environmental impacts; environmental indicators; development instruments.

## 1. Introduction

Tourist destinations have been facing, in the past few years, more and more social, cultural, economic, and environmental challenges. To help them measure their performance in relation to sustainability, which is essential, the European Commission has developed a 'European Tourism Indicators System' (ETIS). ETIS is a system of indicators suitable for all tourist destinations, encouraging them to adopt a more intelligent approach to tourism planning.

It is: a management tool, supporting destinations who want to take a sustainable approach to destination management; a monitoring system, easy to use for collecting data and detailed information and to let destinations monitor their performance from one year to another; an information tool (not a certification scheme), useful for policy makers, tourism enterprises and other stakeholders (Matarazzo et al., 2012).

The evolution of environmental legislation, at a European, national and regional level, towards a regulation of local environmental impacts, together with the growing attention to the issues of Sustainable Development, aims at optimizing the use of resources and reducing the effects on the environment (Matarazzo et al., 2007).

The term "indicator" identifies an instrument able to simplify information related to more complex phenomena, thus favoring comprehension, communication and comparison, making visible a trend or a phenomenon that is not immediately perceptible (Clasadonte et al., 2013; Matarazzo et al., 2018).

In literature there is the distinction between "indicator", a parameter or a value derived from parameters that describes the state of a phenomenon and "index", set of parameters or indicators aggregated and weighed (Miller 2000; Ventura et al., 2019).

## 2. Material and Method

Local authorities have become aware, first through the "Seventh European Union Environmental Action Program", and subsequently with the "Aalborg Charter", to base their decision-making and control activities on several types of indicators. The Seventh Environmental Action Program The program entered into force in January 2014; it is now up to the EU institutions and the Member States to ensure it is implemented, and that priority objectives set out are met by 2020.

The 7th Environment Action Program (EAP) will be guiding European environment policy until 2020. In order to give more long-term direction, it sets out a vision beyond that, of where it wants the Union to be by 2050 (ec.europa.eu). With the signing of the Charter, the European cities and regions are committed to implementing Agenda 21 at local level and to develop long action plans term for a sustainable development (Matarazzo et al., 2009). It is therefore necessary to choose the most suitable indicators to be correlated with the environmental aspects and repercussions of the various sectoral policies (Clasadonte et al., 2011).

The European environmental agency has recognized various main groups of indicators: descriptive indicators (they quantify the environmental state) such as motorization rate, per capita emission of CO<sub>2</sub>; performance indicators (which refers to a target and measure its distance) such as % of separate waste collection on total waste produced, number of beds in hospital facilities; efficiency indicators such as all the expensive cause by the production; global welfare indicators ( which aggregate the

social, economic and ecological dimension) such as Per capita GDP; punctual indicators ( which represents the minimum aggregation sets of data in large lists).

In order to fulfil the practical aim of this study, we could set two main objectives. First, develop an indicator system that is easy to implement, measure, and interpret for application towards improving the sustainability of tourism activities in established destinations. Furthermore, the proposed system allows users to assess the sustainability of activities belonging to the cultural tourism segment. To facilitate information use and interpretation by managers and the general public, it is possible to construct composite indicators of sustainability by using the methodology of the composite indicator of goal programming. Specifically, it is shown how to use this methodology to evaluate the sustainability aim in tourism destinations (Mc Cool and Moisey, 2002). A second objective is to show how local agents can use indicator systems and composite indicators in current tourism policy making. Cultural tourism may contribute to seasonally adjusted tourism and to generating benefits for the local community (Lozano et al., 2012). Surely it is not easy to understand, study and evaluate the effects, so much so that although several studies have been done there is not a real “method” to be followed as there are no models of environmental impact assessment (EIA) generally accepted (D.M. November 2004). The EIA is a process by which we try to verify that a given project can develop by limiting and controlling its negative effects (Farsari Y.-Prastacos P, 2012). Some environmental effects, both positive and negative, can be generated by tourism (De Camillis et al., 2018).

In conclusion, despite the performance indicators allow a faster and better circulation of environmental information within the company and favor, the strengthening of environmental policy (ec.europa.eu), the development of the management system, the improvement of relationships with suppliers, the reduction of emissions and related costs of abatement and prevention, however, until now, they have been used as a communication tool only leaving their application for managerial purposes out of a firm’s policy (Matarazzo and Clasadonte, 2010).

### 3. Case study: the city of Catania

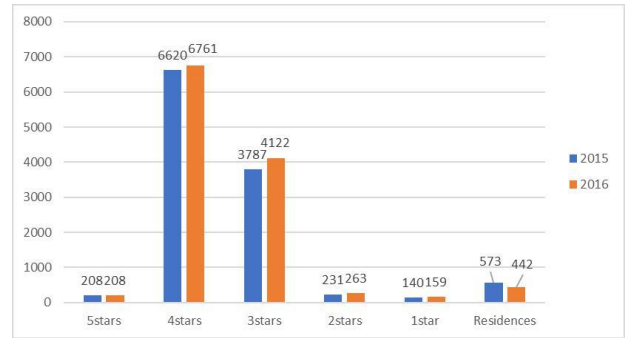
Environmental indicators are essential tools for tracking environmental progress, supporting policy evaluation and informing the public. In this part, the environmental indicators described in the second chapter are used to evaluate the tourism sector of the city of Catania. Environmental indicators and tourism are strictly connected (www.lasicilia.it). For this reason, is useful to analyze some indicators:

Tourist function indices: Accommodation capacity; hotel beds; extra-Hotels beds (catania.mobilita.org).

Flow indicators: arrivals, departure, average stay, attendance, hotels etc.

The data available for Catania (figure 1) is of the year 2016, a year of quantifiable expansion for the tourism sector in the province of Catania, with a growth of 13.6% in the number of business activities and 4.6% in the availability of beds.

**Figure 1.** Hotel Beds in the Province of Catania, 2015-2016



The contribution of the non-hotel sector was decisive, with 114 new structures compared to 2015 (+ 14.9%) reaching the availability of 10.399 beds (32.2% of which available at B & B) equal to + 6% compared to 2015. The hotel sector in the province of Catania has grown; + 6.1% in the number of structures and a + 3.4% in terms of beds.

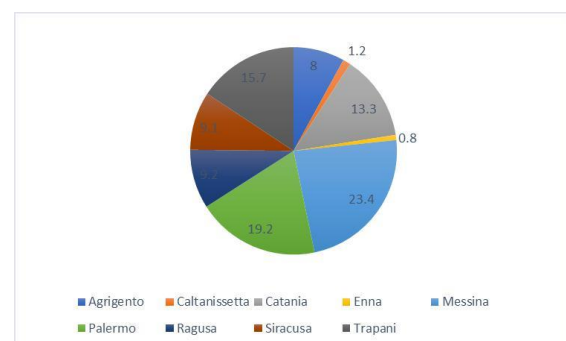
Catania, for its economic activity, represents the biggest and most important center of Sicily; it has acquired this position thanks to its commercial center, which is the richest of the island, and its commerce, that goes beyond the provincial boundaries (Department of Tourism, 2017).

Flow Indicators related to the Province of Catania, represent another tool to observe the sustainability in Tourism. Based on the provisional data available at the Regional Tourist Observatory in 2016, the inter-regional tourist flows showed a decline with rates that stood at - 2.7% for arrivals and -5.6% for presences. The 5.6% contraction recorded in the presences is mostly due to the tourism of our compatriots (-9.6% the Italian presence compared to 2016), while the reduction in the presence of foreigners was much lower (-5.6%), mostly from France and Germany (Donati et al., 2016).

Moreover, it is possible to measure the portion of overnight stays in the 9 Provinces of Sicily compared to the entire Region, looking closely to the case of Catania (figure 1).

Among foreigners, the greatest visitors of Sicily are the French who, both in 2015 and 2016, occupy the first place in the ranking of arrivals from foreign countries to our region. It follows Germany, the United Kingdom and so on (figure 2).

**Figure 2:** Share of overnight stays by province compared to the entire region, 2018



The analysis of environmental indicators in Catania can be focused on the natural protected areas in the Province. There are several protected areas, specifically twelve. This indicator expresses how much of the city's surface is undergoing biodiversity protection measures:

$$LAE = Sc / Spa * 100$$

Sc stands for the surface of the Province of Catania;

Sps stands for the surface of the protected areas.

Considering the surface of the Province of Catania which is 357400ha and the total surface for the protected areas of 157235ha the indicator will be:  $LAE = 357400 / 157235 * 100 = 227,30$  ha

In the table 2 is shown the surface for each area considered in the calculation.

**Table 2.** Protected Areas and their Surfaces in the Province of Catania

Protected area	Year Institution	(ha)
Ciclope Island	2004	623
Simeto Lava holes	2000	1217
Ponte Arca Oasis	2009	70
Nebrodi Park	1993	86000
Etna Park	1987	58000
River Park Alcantara	2001	1927
Fiumefreddo River	1987	10
Immacolatelle e Micio Conti	1998	70
Simeto Oasis	1984	1859
Bosco S.Pietro	1999	6559
La Timpa	1999	225
Simeto River	2000	675

Another fundamental aspects that competes to establish a more efficient tourism level in the city of Catania is the urban viability; reason why the municipality has been trying to set new goals for a continuous improvement.

Catania and its Administration, in the last decade, have been carrying out new measures to reorganize the limited traffic zone (LTZ) in the city center and increase the pedestrian traffic only (table 3).

**Table 3.** Limited Traffic Areas of Catania, 2016

2.396	426
Vehicles licensed to LTZ	LTZ entrances
0% growth rate 2006/2016	-28% growth rate 2012/2016
18	32
Interchange parking	Paid parking on the road
+ 173% growth rate 2012/2016	0% growth rate 2011/2016

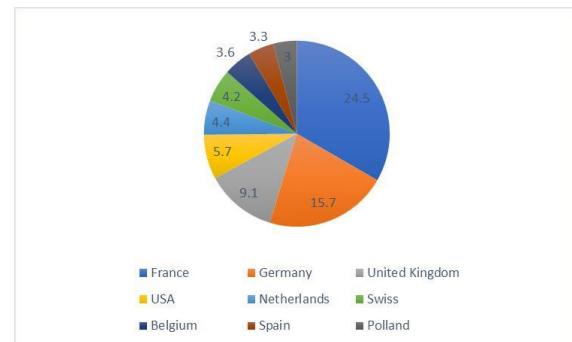
However, the public transportation service has been reduced ( -50%) because of the cuts in the national TPL service in 2010 and because of the financial crisis of AMT Catania: for these reasons, users decrease of the 17% between 2012 and 2016 (Matarazzo et al., 2019).

Statistics say that, in the city of Catania, 68% of people use their own car for movements. To reduce this amount, is necessary to leverage on collecting transportation;

thankfully (Campese C., 2014 ), the underground service has been developed in 2016 in the city of Catania and the Administration is still working to improve it and reach a wider area. The central pedestrian areas have been extended and, during summer, every other Sunday the seafront is closed to the traffic to increase the cycling and pedestrian traffic (Sabbia et al., 2009). Moreover, in 2016 has been installed the car sharing service to reduce the use of private transport.

Again, another step closer to sustainability has been taken to improve the railway service. In 2017 the first Ognina-Catania center sector of 2.6 km which will be connected to the underground and the local railway "Circumetnea" to link every part of the city, has been opened.

**Figure 3:** Incidence of overnight stays of the main foreign visitors in Sicily, 2018



#### 4. Conclusions

The sensibility of public opinion towards a sustainable lifestyle increases with the spread of environmental pollution. The use of mandatory and volunteer tools to respect the environment is the correct action to develop. It is noticeable how tourists appreciate the interventions, for the protection of the environment, promoted by accommodation facilities such as Hotel, B&B and Residences; how they increase their appreciation towards a better environmental quality and how the certification systems of environmental quality are valued.

The main advantages related to the use of the tools previously described can be:

- Economic development of the hotel structure;
- Environmental conservation and the artistic heritage of the destination;
- Waste reduction;
- Optimization of waste management;
- Economic saving;
- Decrease in pollution and environmental impact;
- Use of organic products and consequent contribution to a healthy diet benefits for revenue management (Clasadonte et al., 2012).

In tourists' facilities such as Hotels, Hostel, B&B and residences, the manager should, through an adequate communication plan, inform the potential guests that the structure adopts environmental sustainability measures and, at the same time, instruct the staff on what are the services offered and the ways in which the hotel is committed to saving resources (Arfo' et al., 2020).

There are several approaches usable to develop a sustainable management such as: Adopt measures to save energy and water: recover rainwater for irrigation of green areas and use the magnetic card instead of traditional keys. Today many hotels are equipped with a switch placed next to the door of the room where you can insert this type of magnetic key, inserting it activates the electricity; in this way, if the guest is not present, there will be no energy waste; Separate waste collection; Use electric cars; Take advantage of the short supply chain by establishing partnerships with local companies; Install solar panels; Use recyclable or recycled materials; Use rechargeable packs and ecological products for the courtesy kit; Offer organic and local foods. These and many more approaches can be developed to implement an efficient sustainable tourism system.

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